

ENERGY EFFICIENCY IN NEW HOUSING

Site practice for tradesmen

Introduction



BEST PRACTICE ON SITE

The EEO has commissioned this package of leaflets, site posters and video to help tradesmen with improving site practices when installing thermal insulation. Issues such as condensation, mould growth, concerns over our environment, and reducing energy consumption in our homes have meant that the standards of thermal insulation within our buildings have been steadily improving. With these improvements new standards in site practice and workmanship are required to ensure that the expected performance from the finished house is achieved. **Site practice and workmanship are critical to achieving an energy efficient house.**

These leaflets give practical help in the different methods of building insulation into each part of the house, eg ground floors, external walls, windows/doors and roofs. Illustrations are taken from a series of models built to ensure that the techniques shown work. Many of the methods involved may appear new at first, but are based on current site practices and in time will become commonplace. The importance of supervision and regular checking on site are stressed to ensure that high standards of construction are achieved and technical risks minimised. To help, a checklist has been included on the back of this leaflet.

Two new terms are introduced: air leakage and thermal bridging, both of which are explained overleaf. Both will cause problems in the finished house with condensation, mould growth and excessive energy use.

Following the guidance in these leaflets will result in well insulated houses which are warmer to live in and cheaper to run.

“ Site practice and workmanship are critical to achieving an energy efficient house. ”



THERMAL BRIDGING

Where the insulation is not continuous, or there is a junction in the construction, such as the ground floor with the external walls, a thermal bridge is formed. Thermal bridges can be significant in terms of heat loss but, more importantly, in a well insulated house there is a risk of condensation forming either on the surface or within the construction.

Designers will detail additional insulation to reduce the affects of thermal bridging, but it is essential that the insulation is correctly installed to ensure thermal bridging affects are not a problem.



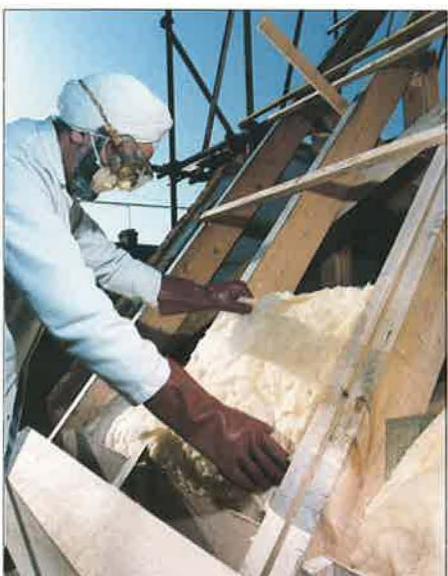
Butt insulation boards tightly with no gaps



Cut boards to fit around openings, leave no gaps



Pack insulation around services passing through the floor, eg soil vent pipe



Install insulation over wall plate early in construction, to avoid having to push insulation into the eaves later



Cut insulation batts or boards to fit toe of lintel

AIR LEAKAGE

The loss of warm air from a house and its replacement with cold air from outside has two significant affects:

- It causes draughts and discomfort to the occupants.
- It can account for as much as one-third to one-half of the heat lost from a well insulated house.

This effect is known as air leakage, and there are basically three types of air leakage path.

- Joints around components, eg windows in walls.
- Gaps between one element and another, eg floor/wall junction.
- Holes for services to pass through.

The methods for sealing these paths will depend on the size of gap, the amount of movement likely to take place, the need for weathertightness, and the practicalities of applying a sealant.

The requirements of the Building Regulations focus on providing controlled ventilation through the provision of trickle ventilators in windows, and mechanical extraction from kitchens and bathrooms. For these measures to be successful, uncontrolled ventilation due to air leakage must be substantially reduced.



Fix DPC and backing tapes to frame prior to installing



When dry lining form continuous solid beads of plaster around openings, at room corners and around socket boxes



With room-in-the-roof construction ensure vapour barrier is continuous from ceiling to wall

Fully seal gap around frame with a suitable sealant



Seal around holes for services in the floor decking and ceilings with expanding polyurethane foam

INTRODUCTION

BEST PRACTICE ON SITE

INSULATION INSTALLATION CHECKLIST

Site

Plot no: House type: Hand: left right

Element	Check list item	Tick if correct	Signed as all correct	Date
GROUND FLOORS including service entries	Insulation sub-base flat DPM/DPCs fixed	<input type="checkbox"/> <input type="checkbox"/>		
	Insulation material as specified No gaps in insulation Insulation trimmed around service entries	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Ventilation to suspended floors Joist/precast beams not projecting into cavity Precast beam and block floors grouted up	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Cold water service entry insulated Service entries air sealed at floor Soil vent pipes air sealed at floor	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
EXTERNAL WALLS	DPC fixed Clean cavity Wall thickness within tolerance Wall ties correctly installed Mortar joints fully filled	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Cavity trays and stop ends Weepholes as specified	<input type="checkbox"/> <input type="checkbox"/>		
	Insulation material as specified No gaps in insulation Insulation trimmed neatly around openings Top of insulation protected in gable walls Meter cupboards insulated behind, and air sealed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Third party certification for insulation contractor	<input type="checkbox"/>		
DOORS AND WINDOWS	Insulation materials as specified Insulation setting out correct Lintels insulated	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Frame fixing as specified	<input type="checkbox"/>		
	Vertical DPC Cavity trays and stop ends Weepholes as specified	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Perimeter seals as specified Surface primer Backing rods/tapes Correct finish profile to sealant	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
ROOFS	Insulation material as specified Eaves insulation correctly positioned No gaps in insulation Insulation not compressed	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
	Ventilation baffles	<input type="checkbox"/>		
SERVICES	Cold water services insulation in loft Primary heating pipework insulated	<input type="checkbox"/> <input type="checkbox"/>		
	Water services air sealed at ceiling to loft Electric services air sealed at ceiling to loft Electric services air sealed at socket boxes Soil vent pipe air sealed at ceiling to loft Loft hatch air sealed and held down	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		

Acknowledgements

The cooperation of the following organisations in the preparation of this Guide is gratefully acknowledged.

Building Employers Confederation, Energy Group North West (CIBSE, CIOB, RIBA, RICS), National House-Building Council, Chartered Institute of Building, DOE, BRE, Construction Industry Training Board, NBA Tectonics, Wimpey Environmental.